EN

Original Instructions
Version 1

100A

BATTERY DROP TESTER

08087

1. Preface

These are the original product instructions. This document is part of the product; retain it for the life of the product, passing it on to subsequent holders. Read this manual in full before attempting to assemble, operate or maintain this product.

This Draper Tools manual describes the purpose of the product and contains all the necessary information to ensure its correct and safe use. Following all the instructions and guidance in this manual will ensure the safety of both the product and the operator and increase the lifespan of the product.

All photographs and drawings within this manual are supplied by Draper Tools to help illustrate correct operation of the product.

Every effort has been made to ensure the information contained in this manual is accurate. However, Draper Tools reserves the right to amend this document without prior warning. Always use the latest version of the product manual.

1.1 Product Reference

User Manual for: Battery Drop Tester, 100A

Stock No: 08087

Part No: BLT100A

1.2 Revisions

Version 1: December 2022
First release

For the latest version of this manual and the associated parts list, if applicable, please visit **drapertools.com/manuals**

1.3 Understanding the Safety Content of This Manual

WARNING! – Situations or actions that may result in personal injury or death.

CAUTION! – Situations or actions that may result in damage to the product or surroundings.

Important: – Information or instructions of particular importance.

1.4 Copyright © Notice

2. Contents

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3. Product Introduction

3.1 Intended use

This product is designed to test the voltage of 6V and 12V lead-acid batteries of up to 100Ah and to test the charging and starting circuits found on many types of vehicles and machinery.

CAUTION! NEVER connect this product to any battery that does not meet the rated requirements of this device as it may cause the battery to explode.

Important: Tests performed on sealed and maintenance free lead-acid batteries may be inaccurate as the specific gravity of the battery acid cannot be measured to confirm that the battery is in good condition.

Part of our core range, this product is suitable for regular use by enthusiasts and tradespersons alike.

WARNING! This product is not a toy and must be respected.

Read this manual in full before attempting to assemble, operate or maintain the product, and retain it for later use.

3.2 Specification

Stock No.	08087
Part No.	BLT100A
Applicable batteries	
Type	Lead-acid
Max. capacity	100Ah
Voltage	6V / 12V
CCA range	200–1,000
Load simulation	100A
Max duty cycle	Max. 10s on, 60s off No more than three tests per 5min

Important: Read all Health and Safety instructions before attempting to operate, maintain or repair this product. Non-compliance with these instructions may result in injury or damage to the user or the product.

4.1 General Health and Safety Precautions

- Observe all standard safety precautions and good practices when working with electrical equipment and lead-acid batteries.
- Ensure that your working environment is well lit, with any bystanders a safe distance away.
- Use the product only as instructed in this manual; **DO NOT** disassemble, open or modify it in any way.
- **ONLY** use spare parts supplied by Draper Tools.
- **DO NOT** use this product if you are tired or under the influence of alcohol, drugs or other medication.
- **DO NOT** use this device in wet environments or expose it to water, other liquids or frost.
- **DO NOT** obstruct or insert foreign objects into the air vents.
- Before every use, inspect the product for broken, cracked, loose or corroded parts and damaged cables. **Important: DO NOT** use this product if it is damaged in any way. **DO NOT** attempt to disassemble a damaged product; contact Draper Tools to discuss repair and replacement options.
- **ALWAYS** wear protective gloves and eye protection while using this product.
- Damaged external cords must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
- **NEVER** carry the product by its external cords.
- Keep this product out of reach of children.

4.2 Additional Safety Instructions for This Battery Drop Tester

WARNING! ONLY use this product to test batteries and circuits for which it is rated. NEVER use this product to test lithium-ion batteries.

- Use this product in well-ventilated areas.
- **NEVER** use this product near flammable substances or substances that produce flammable vapours.
- **DO NOT** place the product on flammable surfaces when in use.
- **DO NOT** use this product near devices that may cause sparks.
- **ALWAYS** ensure that the load test switch is in the off (○) position before connecting the clamps to the terminals.
  - **DO NOT** press the load test switch until both clamps are correctly connected.
- **NEVER** allow the clamps to touch one another or contact the same battery terminal as this may result in current arcing.
- **NEVER** touch both the positive and negative terminals of the connection leads.
- If the terminals are connected incorrectly, rectify the error **IMMEDIATELY**.
- Keep the clamp cables away from hot or sharp engine parts that may cause damage.
- Chock the vehicle wheels and ensure that the vehicle is in neutral (manual transmission) or park (automatic transmission) with the handbrake or parking brake applied if you intend to perform any test that requires the engine to be running.
- Keep clear of parts within the vehicle that move, heat up or emit fumes and may cause harm when the engine is switched on.
  - Allow time for heated parts to cool after the engine is switched off.
- **NEVER** leave the engine running unattended.

WARNING! The metal frame of the product becomes very hot during use.

- **NEVER** hold the load test switch in the on (I) position for more than **10** seconds as the product will heat up excessively and damage its internal parts.
- **NEVER** leave the engine running for more than **five** seconds when performing a charging test as the product will heat up excessively and damage its internal parts.
- **DO NOT** touch the metal body of the tester during or immediately after use.
- **ALWAYS** wear protective gloves when using this product.
- Place this product on a heat-resistant surface during and immediately after use.

4.3 Working With Lead-Acid and Other Vehicle Batteries

WARNING!
Risk of explosive gases.

Working in close proximity to lead-acid batteries is dangerous as they produce potentially explosive gases during normal operation. **ALWAYS** read this manual in full before **EVERY** use and keep your work area well-ventilated. Contact Draper Tools for assistance if you are not confident in the use of this product.

Important: Use this manual in conjunction with the battery manufacturer manual and that of any other equipment to be used in the vicinity. Review all safety markings and rating plates present on the battery, tester and any other nearby equipment before using this product.

- **DO NOT** work with vehicle batteries on your own; **ALWAYS** ensure that someone is nearby to come to your aid if necessary.
- Wear complete eye and hand protection and wear suitable clothing that covers your skin appropriately.
- Avoid touching your eyes while working with lead-acid batteries.
- Keep plenty of fresh water and soap nearby in case battery acid comes into contact with your skin, eyes or clothing.
  - If battery acid comes into contact with your skin or clothing, wash the affected area immediately with soap and water.
  - If battery acid enters your eyes, flush the eye immediately with copious cool and clean running water for at least 15 minutes and seek medical attention immediately.
- Work with lead-acid batteries should **ONLY** be carried out in well-ventilated areas to prevent the build-up of toxic and explosive gases released from the battery.
- Inspect the battery for leakage and damage or cracks in the casing before using this product.

  WARNING! DO NOT test a battery that shows signs of damage or leakage and have it inspected by a qualified technician.

- **NEVER** smoke or allow sparks or flames in the vicinity of the battery or engine.
- Take extra care to prevent metal objects or tools from falling onto the battery as this may cause a spark, short-circuit the battery or cause an explosion.
- **ALWAYS** remove personal metallic objects before use.
  - Lead-acid batteries can produce a short-circuit current high enough to weld metal and cause severe burns.

WARNING! Battery acid is highly corrosive; if the battery begins to leak, stop all operations immediately. If battery acid comes into contact with your eyes or skin, flush with plenty of water and seek immediate medical attention.

WARNING! DO NOT top up the electrolyte beyond the manufacturer's recommended level. Overfilling the battery may cause the acid content to leak.

4.4 Residual Risk

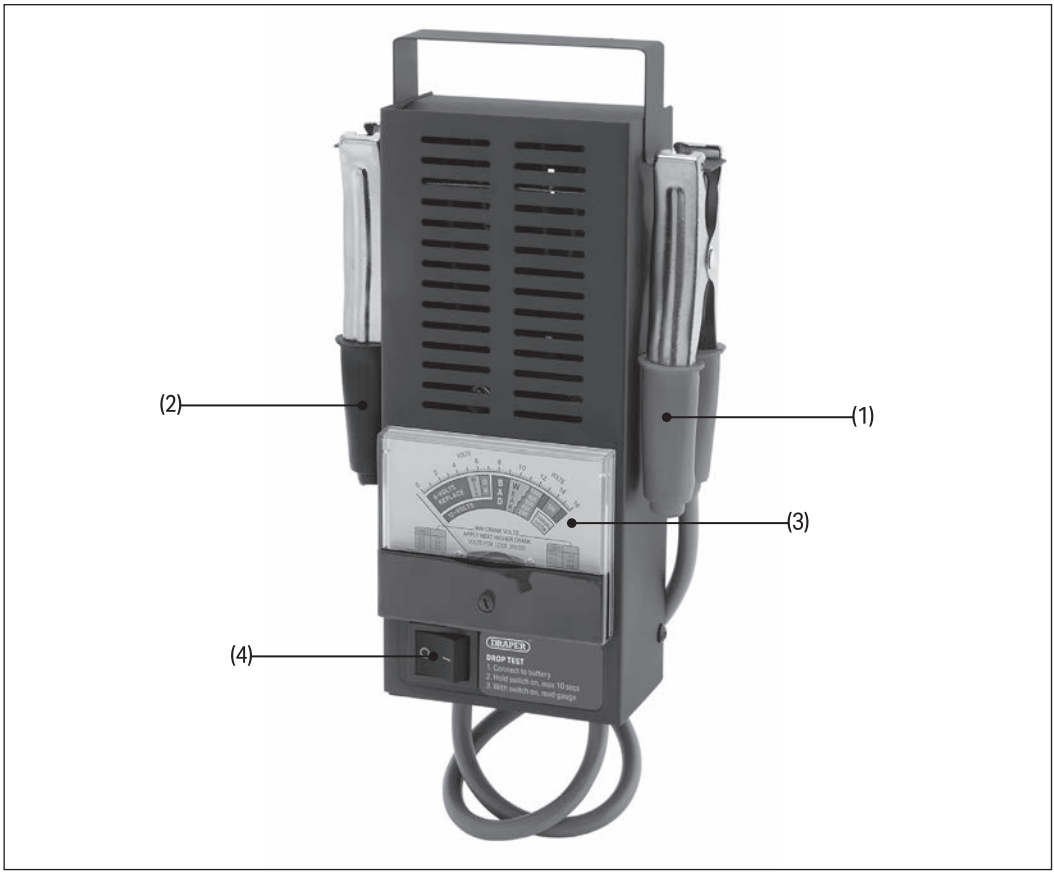
The safety instructions in this manual cannot account for all possible conditions and situations that may occur. Exercise common sense and caution when using this product and protect against any additional conceivable risks.

5. Identification and Unpacking

5.1 Product Overview

Carefully remove the product from the packaging and examine it for any signs of damage that may have occurred during shipment.

If any part is damaged or missing, do not attempt to use the product. Please contact the Draper Helpline; contact details can be found at the back of this manual.



(1) Positive (red) terminal clamp
(2) Negative (black) terminal clamp
(3) Gauge
(4) Load test switch

5.2 Packaging

Keep the product packaging for the duration of the warranty period for reference should the product need to be returned for repair.

WARNING! Keep packaging materials out of reach of children. Dispose of packaging correctly and responsibly and in accordance with local regulations.

Please visit **drapertools.com** for our full range of accessories and consumables.

6. Operating Instructions

Important: Before every use, read and understand all the safety instructions listed in this manual and the manufacturer's information for the battery to be tested. **ALWAYS** ensure that the ignition and engine are switched off and the keys are removed **BEFORE** connecting the clamps to the battery terminals.

Important: Due to the presence of protective oils on the electrical coil, this product may emit smoke during first use. This is normal.

6.1 Connecting the Battery Drop Tester

This connection procedure applies to all test types using this product. Familiarise yourself with the connection, relevant test procedure and gauge readings before use.

Important: If the battery must be removed from the vehicle, ensure that all electrical loads in the vehicle are switched off or disabled before disconnecting it. **ALWAYS** disconnect the earth terminal from the battery first.

Loss of audio and security codes can be prevented by connecting a memory saver (Draper Stock Nos. 22277 or 22231) before disconnecting the battery.

Important: Ensure that the vehicle or battery is level before checking and topping up the electrolyte.

1. Clean any corrosion from the battery terminals

   WARNING! Take care to prevent corrosion materials from coming into contact with your eyes and skin.

2. Remove the cell filler caps and check the level of the electrolyte in each cell.
   Top up the cell with distilled water as necessary until the manufacturer's recommended level is reached.

   CAUTION! Top up with distilled water ONLY. NEVER top up lead-acid batteries with tap water.

   WARNING! Battery fluid is corrosive. DO NOT touch the battery fluid or overfill the cells.

3. Replace the cell filler caps and identify the terminals.
4. Connect the positive (red) terminal clamp (1) to the positive terminal and the negative (black) terminal clamp (2) to the negative terminal.
   Rock the clamps back and forward on the terminals to ensure a good connection.
5. Once connected, the gauge (3) needle should move to the right; this indicates the current voltage of the battery (see table below).

Important: Take note the value displayed so it can be compared with the results of the appropriate test.

6. Remove the surface charge of the battery to ensure an accurate reading; methods for doing so include:
   a. Switch on the headlights (full beam) for 3–5 seconds
   b. Disable the ignition and crank the engine for 10–15 seconds
   c. Allow approximately 60 minutes for the surface charge to dissipate
7. Use a hydrometer to test the specific gravity of the battery acid; see **6.2 Measuring the Specific Gravity of a Cell.** This will determine the condition of the battery.
8. Perform the required battery test; see **6.3, 6.4** and **6.5**.

Gauge response	Meaning	Action
The needle indicates approx. 12.4V (12V batteries) or 6.2V (6V batteries).	The battery is fully charged.	Proceed with the required test.
The needle indicates slightly less than 12.4 (12V batteries) or 6.2 (6V batteries).	The battery is partially discharged.	Disconnect the tester and fully charge the battery before proceeding.
The needle moves only a small amount or not at all (0V reading).	The connection between the tester and the battery is poor.	Check the terminal connections.
The needle moves to the left (below zero).	The terminal clamps are connected with reverse polarity.	**IMMEDIATELY** and safely disconnect the tester and reconnect the terminal clamps correctly.

6.2 Measuring the Specific Gravity of a Cell

Important: The specific gravity of the battery acid cannot be measured on maintenance-free batteries. If recharging the battery does not improve the voltage of a maintenance-free battery, seek advice from a qualified technician.

The specific gravity of the battery acid in conventional unsealed lead-acid batteries can be tested using a hydrometer (not supplied). The specific gravity should measure 1.25–1.28g/cm^3 at full charge.

The specific gravity should be roughly equal in all six cells of the battery. If the difference between the highest and lowest measurements across the cells is greater than 0.025 (25 points), there may be a fault in one of the cells.

If the specific gravity remains below 1.24g/cm^3 after the battery has been fully charged, the battery may have sulphated. If this has occurred, the battery should be replaced.

Specific Gravity measurement (g/cm3)	Battery state	Action
1.25–1.28	Fully charged	Drop test readings are likely to be reliable
1.20–1.24	Partially charged	Charge the battery before testing
<1.2	Low charge	Charge the battery **IMMEDIATELY** and replace it if it does not hold its charge

6.3 Performing a Battery Drop Test

1. Identify the cold cranking amp rating of the battery to be tested.
   Important: For this test, this is necessary for 12V batteries only.
2. Safely connect the tester to the battery; see **6.1 Connecting the Battery Drop Tester.**
3. Observe the reading on the gauge (3).
   At full charge, the battery should exhibit a voltage level at approximately 12.4V or 6.2V, depending on the battery.
4. Place the tester on a heat-resistant surface, ensuring that the cables are not trapped underneath the metal casing.
5. Press and hold the load test switch (4) in the on (I) position for no longer than 10 seconds until the gauge needle stabilises.

   ⚠ **WARNING! The metal casing of the tester becomes very hot very quickly while the load test switch is depressed.**

   a. **ALWAYS** ensure that the tester is on a heat-resistant surface or you are using heat-resistant gloves during and immediately after this test.
   b. **NEVER** hold the load switch in the on position for more than 10 seconds.
6. Observe and note the new reading on the gauge; see **7. Reading a Battery Drop Test Result.**
7. Release the load test switch and disconnect the tester unless further testing is required.

Important: The temperature of the battery will impact on the results of this test. For optimal results, the battery should be tested at above 10°C (50°F).
To compensate for lower temperatures, see **7.3 Temperature Compensation.**

Important: Allow the battery tester to cool for at least one minute before performing another test. **DO NOT** perform more than three tests in five minutes.

6.4 Performing a Charging System Test

Important: This test is only applicable for 12V batteries. **DO NOT** start the engine until after the tester is correctly connected.

1. Safely connect the tester to the battery; see **6.1 Connecting the Battery Drop Tester.**
2. Perform a battery drop test; see **6.3 Performing a Battery Drop Test.**

CAUTION! If the test does not deliver a result in the appropriate GREEN band, DO NOT proceed with the charging system test.

3. Ensure that the handbrake or parking brake is engaged and that the vehicle is in neutral or park.
4. Safely reconnect the terminal clamps to the battery, start the vehicle engine and allow it to reach normal operating temperature.

WARNING! DO NOT run the vehicle for more than five seconds with the tester connected. DO NOT press the load switch while performing this test.

WARNING! Keep all loose clothing, hair and jewellery safely secured and stay clear of moving or heated parts in the vehicle.

5. Depress the accelerator and run the vehicle engine at 1,200–1,500rpm for no more than **five seconds.**
6. Observe and note the gauge reading; see **8. Reading a Charging System Test Result.**
7. Release the load test switch and disconnect the tester.

6.5 Performing a Starter Motor Test

Important: This test is only applicable for 12V batteries. **DO NOT** start the engine until after the tester has been correctly connected.

1. Safely connect the tester to the battery; see **6.1 Connecting the Battery Drop Tester.**
2. Perform a battery drop test; see **6.3 Performing a Battery Drop Test.**

CAUTION! If the test does not deliver a result in the appropriate GREEN band, DO NOT proceed with the charging system test.

3. Safely reconnect the terminal clamps to the battery and disconnect the spark plug cables from the spark plug to prevent the engine from starting.
   If this is not possible, see the vehicle manufacturer's instructions for other ways to disable the ignition.
4. Turn the key in the ignition to trigger the starter motor.

CAUTION! DO NOT press the load test switch during this test.

5. Observe and note the gauge reading during cranking; see **9. Reading a Starter System Test Result.**
6. Release the load test switch and disconnect the tester unless further testing is required.

7. Reading a Battery Drop Test Result

For drop tests on 6V or 12V batteries, read the appropriate section of the gauge display:

(5) 6V battery test region

(6) 12V battery test region

(7) Gradated CCA scale

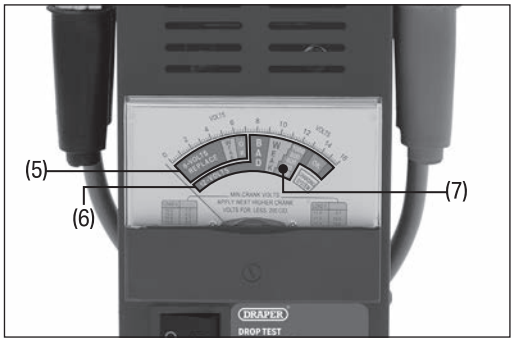


Fig. 1

7.1 6V Battery Drop Tests

The results for 6V battery drop tests are shown in the 6V battery test region (5). Observe the colour zone of the reading when the load test switch (4) is held for 10 seconds.

7.2 12V Battery Drop Tests

The results for 12V battery drop tests are shown in the 12V battery test region (6). Observe the colour zone of the reading against the appropriate value of the gradated CCA scale (7) when the load test switch (4) is held. Read around the scale at the highest level that does not exceed the CCA rating of the battery being tested.

For example, for a 12V battery rated 700 CCA, read the gauge level with the 600 value marking.

7.3 Temperature Compensation

Battery drop tests should be performed when the ambient temperature is above 10°C (50°F). At significantly lower temperatures, temperature compensation should be applied to the gauge reading.

Deduct the appropriate number of amps from the CCA rating and read the gauge accordingly.

Battery/Ambient temperature	Reduce CCA rating by
-7 to 17°C	50A
-18 to 28°C	100A
Lower than -29°C	150A

7.4 Interpreting the Results

- A reading in the green band in conjunction with a good specific gravity measurement indicates good battery condition.
  Important: This reading may be inaccurate if the battery was not fully charged before performing the test. **ALWAYS** perform this test on a fully charged battery containing the correct volume of electrolyte.
- A **STEADY** reading in the yellow or red bands in conjunction with a good specific gravity measurement indicates that the battery condition may be compromised.
  - Ensure that the battery is fully charged and retest.
- A **FALLING** reading in the yellow or red bands indicates that the battery is run down or faulty.
- To quickly test for faults, observe the gauge response when the load test switch is released:
  - If the voltage returns with a few seconds to 12.4V (12V batteries) or 6.2V (6V batteries), the battery is likely to be faulty.
  - If the voltage returns slowly to 12.4V (12V batteries) or 6.2V (6V batteries), the battery may only be run down.

8. Reading a Charging System Test Result

For charging system tests, read the CHARGING SYSTEM region (8) of the gauge display.

- A reading in the green **OK** area indicates that the charging system is operating correctly.
- A reading in the lower (left) red area indicates that the charging system is not charging the battery sufficiently.
- A reading in the upper (right) red area indicates that the charging system is overcharging the battery, which may cause the battery to explode.

Important: If the gauge gives a reading in either of the red areas of the CHARGING SYSTEM region, have your alternator inspected by a qualified technician.

Fig. 2

9. Reading a Starter System Test Result

For starter system tests, read the MIN CRANK VOLTS chart (9) at the bottom of the gauge display.

Using the initial voltage reading taken when the tester was first connected as the **Load Volts** value, compare the corresponding **Min. Crank Volts** value with the reading achieved during the starter test.

If the reading taken during the starter test is below the **Min. Crank Volts** value, there may be a problem with the starter system. This may be due to a faulty starter motor drawing excessing current from the battery, poor connections in the system, or the battery being too small for the requirements of the vehicle. Seek advice from a qualified technician.

Important: For vehicles with 200 CID engines or smaller, use the next higher Min. Crank Volts value when comparing the starter test results.

Fig. 3

Load Volts	10.2	10.4	10.6	10.8	11	11.2	11.4
Min. Crank Volts	7.7	8.2	8.7	9.2	9.7	10.2	10.6

10. Product Care and Storage

Important: No parts of this product are serviceable by the user, but basic care is required to keep it in good working order.

- Keep the terminal clamps (1) (2) free from corrosion.
  - Use a wire brush to clean the clamps if corrosion materials begin to accumulate.
- Clean the product casing with a soft, damp cloth **ONLY**.
- **DO NOT** use solvents or other aggressive chemicals to clean any part of the product as they may damage plastic or insulated parts.
- Keep the ventilation openings on the product casing free from dust and debris.
  - Use compressed air to remove debris from the ventilation openings.
- Store the product in a clean and dry environment, out of direct sunlight and out of reach of children.
  - **DO NOT** expose this product to water or frost.
- Store the product led flat on its rear face or in an upright position.
- Store the terminal cables tidily so that they are not kinked, pinched or crushed by other objects.

11. Spares, Returns and Disposal

For spare parts, servicing, and repair and replacement options, please contact the Draper Tools Product Helpline for details of your nearest authorised agent.

Draper Tools will endeavour to hold any spare parts, if applicable, for seven years from the date that it sells the final matching stock item.

Any servicing or repairs carried out by unauthorised personnel or installation of spare parts not supplied by Draper Tools will invalidate your warranty.

At the end of its working life, dispose of the product responsibly and in line with local regulations. Recycle where possible.

- **DO NOT** dispose of this product with domestic waste; most local authorities provide appropriate recycling facilities.
- **DO NOT** burn or mutilate this product.

Important: Dispose of old or faulty batteries separately, responsibly and in accordance with local regulation.

12. Warranty

Draper Tools products are carefully tested and inspected before shipment and are guaranteed to be free from defective materials and workmanship.

Should the tool develop a fault, return the complete tool to your nearest distributor or contact Draper Tools directly. Contact information can be found at the back of this manual.

Proof of purchase must be provided.

If, upon inspection, it is found that the fault occurring is due to defective materials or workmanship, repairs will be carried out free of charge. This warranty period covers parts and labour for 12 months from the date of purchase. Where tools have been hired out, the warranty period covers 90 days from the date of purchase.

This warranty does not apply to any consumable parts, batteries or normal wear and tear, nor does it cover any damage caused by misuse, careless or unsafe handling, alterations, accidents, or repairs attempted or made by any personnel other than the authorised Draper Tools repair agent.

In all cases, to make a claim for faulty workmanship or materials within the standard warranty period, please contact or return the product to the place of purchase. Proof of purchase may be required.

If the place of purchase is no longer trading or if you experience any difficulties with your warranty, please contact Customer Services with the product details and your proof of purchase. Contact details can be found at the back of this manual.

If the tool is not covered by the terms of this warranty, repairs and carriage charges will be quoted and charged accordingly.

This warranty supersedes any other guarantees expressed or implied and variations of its terms are not authorised.

Your Draper Tools guarantee is not effective until you can produce, upon request, a dated receipt or invoice to verify your purchase within the guarantee period.

Please note that this warranty is an additional benefit and does not affect your statutory rights.

Draper Tools Limited

13. Explanation of Symbols

Read the instruction manual

Warning!

Do not incinerate or throw onto fire

Wear protective gloves

Wear safety glasses

Keep out of the reach of children

WEEE –

Waste Electrical & Electronic Equipment

Do not dispose of Waste Electrical & Electronic Equipment in with domestic rubbish

UK Conformity Assessed

European conformity

Contact Details

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Please contact the Draper Tools Product Helpline for repair and servicing enquiries.